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BOYD, T EXAMINER

JACKSON E. STANLAND  
IBM INTELLECTUAL PROPERTY LAW DEPT.  
P.O. BOX 218  
YORKTOWN HEIGHTS, NY 10598

ART UNIT	PAPER NUMBER
115	20

DATE MAILED: 08/08/90

This is a communication from the examiner in charge of your application.  
COMMISSIONER OF PATENTS AND TRADEMARKS

This application has been examined  Responsive to communication filed on \_\_\_\_\_  This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), 0 days from the date of this letter.  
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1.  Notice of References Cited by Examiner, PTO-892. 2.  Notice re Patent Drawing, PTO-948.  
3.  Notice of Art Cited by Applicant, PTO-1449. 4.  Notice of Informal Patent Application, Form PTO-152  
5.  Information on How to Effect Drawing Changes, PTO-1474. 6.  \_\_\_\_\_

Part II SUMMARY OF ACTION

1.  Claims 1 - 95 are pending in the application.

Of the above, claims 12-26, 36-39, 55-59 + 64 are withdrawn from consideration.

2.  Claims \_\_\_\_\_ have been cancelled.

3.  Claims \_\_\_\_\_ are allowed.

4.  Claims 1-4, 27-35, 40-54, 60-63 + 65-68 are rejected.

5.  Claims \_\_\_\_\_ are objected to.

6.  Claims \_\_\_\_\_ are subject to restriction or election requirement.

7.  This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8.  Formal drawings are required in response to this Office action.

9.  The corrected or substitute drawings have been received on \_\_\_\_\_. Under 37 C.F.R. 1.84 these drawings are  acceptable;  not acceptable (see explanation or Notice re Patent Drawing, PTO-948).

10.  The proposed additional or substitute sheet(s) of drawings, filed on \_\_\_\_\_, has (have) been  approved by the examiner;  disapproved by the examiner (see explanation).

11.  The proposed drawing correction, filed \_\_\_\_\_, has been  approved;  disapproved (see explanation).

12.  Acknowledgement is made of the claim for priority under U.S.C. 119. The certified copy has  been received  not been received  been filed in parent application, serial no. \_\_\_\_\_; filed on \_\_\_\_\_.

13.  Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14.  Other \_\_\_\_\_

EXAMINER'S ACTION

Art Unit 115

1. Restriction to one of the following inventions is required under 35 U.S.C. § 121:

I. Claims 1-11, 27-35, 40-54, 60-63, and 65-68, drawn to a superconducting composition, classified in Class 423, subclass 604.

II. Claims 24-26, 73-76, 82-83 and 86-90, drawn to a method of making a method of making, classified in Class 505, subclass 725.

2. III. Claims 12-23, 36-39, 55-59, 64, 69-72, 77-81, 84-85 and 91-95, drawn to a superconductor apparatus, classified in Class 505, subclass 825.

3. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (M.P.E.P. § 806.05(f)). In the instant case the product as claimed can be made by a materially different process such as sputtering.

4. Inventions I and III are related as mutually exclusive species in intermediate-final product relationship. Distinctness is proven for claims in this relationship if the intermediate

product is useful to make other than the final product (M.P.E.P. § 806.04(b), 3rd paragraph), and the species are patentably distinct (M.P.E.P. § 806.04(h)).

In the instant case, the intermediate product is deemed to be useful as a diamagnetic material used for bulk levitation and the inventions are deemed patentably distinct since there is nothing on this record to show them to be obvious variants. Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions anticipated by the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. § 103 of the other invention.

5. Inventions II and III are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (M.P.E.P. § 806.05(f)). In the instant case the process can be used to make a materially different product such as a bulk diamagnetic material used for levitation.

6. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of

Art Unit 115

their recognized divergent subject matter restriction for examination purposes as indicated is proper.

7. During a telephone conversation with Mr. Jackson B. Stanland on July 17, 1990 a provisional election was made with traverse to prosecute the invention of I, claim s 1-11, 27-35, 40-54, 60-63 and 65-68. Affirmation of this election must be made by applicant in responding to this Office action. Claims 12-26, 36-39, 55-59 and 64 are withdrawn from further consideration by the Examiner, 37 C.F.R. § 1.142(b), as being drawn to a non-elected invention.

8. The following is a quotation of the first paragraph of 35 U.S.C. § 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification is objected to under 35 U.S.C. § 112, first paragraph, as failing to provide an enabling disclosure commensurate with the scope of the claims. The present specification is enabled only for compositions comprising  $Ba_xLa_{5-x}Cu_5O_y$ .

The art of high temperature (above 30°K) superconductors is an extremely unpredictable one. Small changes in composition can result in dramatic changes in or loss of superconducting

Art Unit 115

properties. The amount and type of examples necessary to support broad claims increases as the predictability of the art decreases. See In re Fisher, 166 U.S.P.Q. 18, 24 and In re Angstadt and Griffin, 190 U.S.P.Q. 214, 218. Claims broad enough to cover a large number of compositions that do not exhibit the desired properties fail to satisfy the requirements of 35 U.S.C. 112. See In re Cook, 169 U.S.P.Q. 244, 262. Merely reciting a desired result does not overcome this failure. In re Corkill, 226 U.S.P.Q. 1005, 1009. In particular, the examiner questions if any material containing copper will exhibit superconductivity? Is CuO a superconductor? Is any stoichiometric combination of a rare earth, an alkaline earth and copper a superconductor? Is  $Ce_{15}Mg_{0.05}Cu_{0.5}O_x$  a superconductor? Is  $Ba_xLa_{5-x}Ni_{5}O_y$ ? Is  $Mg_{10}Y_{0.05}Fe_{0.05}O_1$ ? It should be noted that at the time the invention was made, the theoretical mechanism of superconductivity in these materials was not well understood. (This is still the case today). Accordingly, there appears to be little factual or theoretical basis for extending the scope of the claims much beyond the proportions and materials actually demonstrated to exhibit high temperature superconductivity. A "patent is not a hunting license. It is not a reward for the search, but a reward for its successful conclusion", Brenner v. Manson, 383 U.S. 519, 148 U.S.P.Q. 689.

9. Claims 1-11, 27-35, 40-54, 60-63 and 65-68 are rejected

under 35 U.S.C. § 112, first paragraph, for the reasons set forth in the objection to the specification.

10. Claims 1-11, 27-35, 40-54, 60-63 and 65-68 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. What does the term "near rare earth-like element" mean?

What elements does this language exclude? What does it include?

12. These claims are indefinite as each fails to recite any stoichiometric limitation. How does one determine the metes and bounds of the present invention?

13. Claim 11 recites "doping". How much dopant is required? Will using 0.0001% produce the desired result?

14. What is meant by "enhances electron-phonon interactions to produce superconductivity"?

15. Claim 32 recites "in said composite". There is no antecedent basis for "composite"? In addition, composite implies a material made up of distinct components, such as a cermet. Is applicant claiming such a material?

16. Claim 62 recites an "oxygen excess"? What is this "excess" in relation to? How does one determine this?

17. The term "transition temperature" is indefinite. Does this term correspond to the temperature at which resistivity is zero? Or does it relate to the temperature at which the resistivity

begins to drop? If the latter is true, at what temperature is zero resistivity reached?

18. claim 40 recites "said superconductor being comprised of at least four elements". This term is vague and indefinite. How does one select these elements? Will any combination of four elements in any stoichiometric ratio produce the desired result?

19. The present application was filed in the United States on May 22, 1987. Applicants have submitted declarations from the inventors and various U.S. researchers to establish an earlier conception and reduction to practice data. It is not fully clear what exact date ~~the~~ Applicants are entitled to. It would appear to be no earlier than the date at which a sample and enabling disclosure (Z. Phys. B- Condensed matter article) was brought to the United States from switzerland by Praveen Chaudhari on approximately October 17, 1986 (see Chaudhari Declaration). It would also appear to be no later than the date at which the <sup>in the U.S.</sup> samples were tested<sup>^</sup> to show superconductivity on approximately December 13, 1986 (see Green Declaration, page 1 of Exhibit D). In view of the fact that there is no art of record that discloses <sup>Ba</sup>La<sub>2-x</sub>Cu<sub>x</sub>O as a superconducting system prior to January 1, 1987, there is no need for us at this time to make a definite judgement as to which date represents reduction to practice. For the purpose of record a number of references having a filing date later than January 1, 1987 are cited here. Each clearly teaches

Art Unit 115

superconductivity in a material containing lanthanum, alkaline earth, copper and oxygen but are not considered prior art by this Office. It should be noted that the Ganguly reference recites December 1986 at the top of the article. This was not the date of publication as shown by the 1987 references cited at the end of the article. An exact date has not been established, however, it is certain to be later than January 1, 1987.

20. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --  
(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

21. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same

Art Unit 115

person or subject to an obligation of assignment to the same person.

The "person having ordinary skill" in this art has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in this case reasonably reflect this level of skill.

22. Claims 1-11, 27-35, 40-54, 60-63 and 65-68 are rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103 as obvious over each of Shaplygin et al, Nguyen et al, Michel et al. (Mat. Res. Bull. and Revue de Chimie). Shalygin discloses  $Ln_{2-4}M_xCuO_4$  where M is Ca, Sr, Ba and Pb and Lu is La, Pr, Nd, Sm, Eu and Gd.  $La_{2-x}Ca_xCuO_4$  is disclosed on page 823. Nguyen discloses  $La_{2-x}Sr_xCuO_{4-y}$ . Michel (Revue de chimie) discloses  $La_{2-x}A_{1+x}Cu_2O_4$  where A=Ca, Sr, Ba. Michel (Mat.Res.Bull.) discloses  $BaLa_4Cu_5O_{13.4}$  and  $La_3Ba_3Cu_6O_{14+x}$ . Although these references fail to disclose superconductivity, each appears to fall within the scope of the presently claimed subject matter. Accordingly, the burden of proof is upon applicants to show that the instantly claimed subject matter is different from and unobvious over that taught by this reference. See In re Brown, 173 U.S.P.Q. 685, 688; In re Best, 195 U.S.P.Q. 430 and In re Marosi, 218 U.S.P.Q. 289, 293.

23. Claims 1-2, 5-11, 40-44, 46, 48, 49, 51-54, 60, 62, and 66 are rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103 as obvious over each of

Art Unit 115

Perron-Simon et al, Mossner et al, Chincholkar et al, Amad et al, Blasse et al, Kurihara et al and Anderton et al. Perron-Simon discloses  $Ba_2La(Nb_{13/3})O_{15}$ . Mossner discloses  $Ba_6YNb_{4.5}O_{18}$ . Chincholkar discloses  $Ba(Ln_{0.5}B_{0.5})O_3$ . Ahmad discloses  $Ba_2YNbO_6$ . (page 43). Blasse discloses  $Ba_2GdNbO_6$ . Kurihara discloses  $Ba(yNb)_{0.5}O_3$ . Anderton discloses  $La_{0.5}Sr_{0.5}CoO_3$ . Although none of the cited references discuss superconductivity, each appears to fall within the scope of the claims. Furthermore, Ogashi (not considered prior art) teaches that La-Sr-Nb-O systems are superconducting. The case law cited at the end of the previous paragraph applies here as well.

24. Because of the fast moving pace of research in the field of high temperature superconductors, many scientific developments in this area are available as "preprints" many weeks or months prior to publication in a journal. It is the Examiner's position that such preprints are prior art as a printed publication under 35 U.S.C. 102(a) or (b) as of the date they are first distributed.

<sup>^</sup>See 3M v. Ansul, 213 U.S.P.Q. 1024, 1037. Any information of the above noted type that is material to the presently claimed <sup>subject</sup> matter available prior to the effective filing date of this application that applicant(s) are aware of should promptly be made of record pursuant to M.P.E.P. 609 and 37 CFR 1.56.

25. Any evidence to be presented in accordance with 37 CFR 1.131 or 1.132 should be submitted before final rejection in order to

Serial No. 053,307

-11-

Art Unit 115

be considered timely. It is anticipated that the next Office Action <sup>may</sup> ~~will~~ be a final rejection.

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Boyd whose telephone number is (703) 557-8777.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 557-2517.

JBoyd  
August 07, 1990

*Paul Lieberman*

PAUL LIEBERMAN  
SUPERVISORY PRIMARY EXAMINER  
ART UNIT 115